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DESCRIPTION OF TWO NEW PONTOGENIID SPECIES (POLYCHAETA:APHRODITIDAE) FROM THE SOUTH WEST PACIFIC.

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ABSTRACT

Pontogenia soelae n.sp. from deep waters of the Marion Plateau, NE Australia and *Pontogenia phaeogramma* n.sp. from a coral reef lagoon in New Caledonia are described. A diagnosis of the genus *Pontogenia* is given. A detailed description of the two new species and comparison with other species is provided.

KEYWORDS: Polychaeta, Aphroditidae, *Pontogenia*, new species, S.W. Pacific.

INTRODUCTION

Small numbers of the 14 nominal species of *Pontogenia* have been recorded infrequently from warm waters, world-wide, between 40°N and 40°S. The majority of the descriptions of new species are based on only 1 or 2 specimens. The most recent preliminary review of pontogeniids is by Pettibone (1966). The need for a revision of *Pontogenia* species is long overdue (Watson Russell 1989).

Surveys carried out by the CSIRO research vessel F.R.V. *Soela* recently collected a pontogeniid specimen in deep water from the Marion Plateau, northern Queensland. I wish to thank Sandy Bruce for the retrieval of this unique individual which proved to be a new species.

Surveys by ORSTOM also have collected moderate numbers of pontogeniids from the coral reef lagoons of New Caledonia in recent years. Amongst these collections were three specimens belonging to a new species of *Pontogenia*. This material was made available for study through Russell Hanley who is presently identifying scaleworm material from the ORSTOM laboratory collections in New Caledonia.

Abbreviations used in the text are: CSIRO, Commonwealth Scientific and Industrial Research Organisation, Hobart; NTM, Northern Territory Museum, Darwin; MNHN, Muséum National d'Histoire Naturelle, Paris; ORSTOM, Institut Français de Recherche Scientifique pour le Developpement en Cooperation, Noumea.

SYSTEMATICS

Genus *Pontogenia* Claparède

Pontogenia Claparède,1868:368-371
Triceratia Haswell, 1882: 274-274
Pontogenessa Monro, 1924: 68-69
Type species: *Hermione chrysocoma* Baird, 1865, by monotypy.

Diagnosis. Body rectangular, broad or slender, slightly tapered anteriorly and posteriorly. Dorsum covered by stout paleal notosetae. Segments up to 60. Elytra number up to 18 pairs, with or without small papillae.

Prostomium rounded with globular ocular peduncles each with a pair of eyes; median antenna with stout ceratophore and long, style of 2 articles; pair of long tapered palps; papillate facial tubercule. First or tentacular segment with tentaculophores anterolateral to prostomium, uniramous, each with two pairs of dorsal and ventral tentacular cirri; capillary setal fascicles with or without additional paleal notosetae.

Second or buccal segment biramous with elytra; notopodia usually with stout paleal setae; neuropodia with few slender bidentate

neurosetae, lower group of bipinnate neurosetae, long ventral buccal cirri. Segment 3 with first pair of dorsal cirri; neurosetae as on segment 2.

Notopodia of mid-body segments with notosetae of 3 kinds: dorsal feltage, well or poorly developed; short and/or long capillary setae; stout or slender, flattened or rounded, serrated or smooth, golden yellow paleal setae. Notosetal types may be the same on all mid-body notopodia; well or less well developed; present or absent between cirrigerous and elytragerous segments.

Neuropodia of mid body segments with usually 4 (one species with up to 11) neurosetae, stout with curved tip, with lateral spur or smooth.

Pontogenia soelae sp.nov.
(Figs 1-2; Pl. 1a-b)

Type material. HOLOTYPE- NTM W.3853: NE Australia, Marion Plateau, 22° 12.0' S, 153° 30.4' E, Station 15, trawled, coll. FRV *Soela*, Cruise 0685, presented A.J. Bruce, 303-333m, 19 November 1985.

Description. Holotype length 64mm, width 27mm, 42 segments. Body large, rectangular. Ventrum thickly papillate, pale pink colour. Dorsal surface smooth, thin skinned, covered by elytra and felt on cirrigerous segments. Dense fascicles of short capillary notosetae, prominent lateral paleal notosetae in radiate pattern, plus large, semi-erect, golden brown, spinose mid-group palcal fans (some with foraminifera attached) present on cirrigerous and elytragerous segments (Plate 1A-B). Elytra 15 pairs, on segments 2,4,5,7,9...,25,28,31. Elytra white with pearly sheen, ovoid shape, with scattered small peg-like papillae along inner margin; under high magnification elytron surface reticulated with minute granular pattern (Fig. 2M).

Prostomium rounded, with brownish pigment on sides; pair of oval ocular peduncles with small dorsal and larger ventral eyes; stout papillate median ceratophore, median style missing; palps purple-pink colour with greenish-blue iridescent sheen, long with long attenuated tips, left palp longer than right palp, smooth under low magnification; facial tubercle medial to palps, long, elongate, purple with long papillae (Fig. 1A).

First or tentacular segment with elongated uniramous tentaculophore projecting antero-laterally to prostomium (Fig. 1B); 2 thick fascicles of capillary notosetae; fascicles of short, smooth paleae; short, curved serrate paleae plus long, slender, pointed, serrate paleae (Figs 1B, 2N); pair of dorsal and ventral tentacular cirri, styles missing.

Second or buccal segment with biramous parapodia extending antero-laterally to mouth; with first pair of elytra; neuropodia with 3 tiers of slender neurosetae; 3 upper with lateral spur (bidentate) and blunt spinelets; mid group of many long bipinnate setae; lower group of many short bipinnate setae (Fig. 2A-C); ventral or buccal cirri with long cirrophores, styles missing.

Third segment with first pair of dorsal cirri; neurosetae as in segment 2, ventral cirri short, slender, as in succeeding segments. Fourth segment with neuropodia each with total of 11 bidentate neurosetae, arranged in 3 tiers: 2 long, upper, 4 mid-group, 5 short, lower-group; all slender with single basal spur and long distal tip with inner distal marking, some with spinelets (Fig. 2D-G). Neuropodia of following segments with 10 neurosetae, of similar lengths, with short, robust basal spur, thick tips with distal-most marking; some with minute spinelets (Fig. 2H).

Dorsal cirri on cirrigerous segments mid-body with cirrophores on posterior side of notopodia, with style as long as paleal fan, with elongate, flattened tips (Fig. 1D,F). Anterior palcal notosetae comprised of short, dense lateral group (LP) in radiate pattern, numbering about 50, pale golden colour, slender, pointed, mostly with 2 rows of slender spines (a few sometimes smooth); dense fascicle of mid-group paleae (MP) in semi-radiate pattern, numbering about 60, very short anteriorly, plus medium length to long, paleae dark golden colour, slender, pointed, all with double rows of long spines, placed very close together along length of paleae (Figs 1C, D, 2O). Short, thick fascicle of whitish capillary notosetae (C) with red-gold iridescence, in latero-ventral position on each segment (Fig. 1C,D). Well developed, long, golden feltage (F) present only on cirrigerous segments (Fig. 1C,D). Dorsal tubercle (DT) with few long papillae dorsal to cirrophore of dorsal cirrus (Fig. 1D).

Elytragerous segments mid-body with similar notosetae except feltage setae absent. Very fine, silky, short, pale gold capillary notosetae (resembling 'fluff') present in centre of paleal

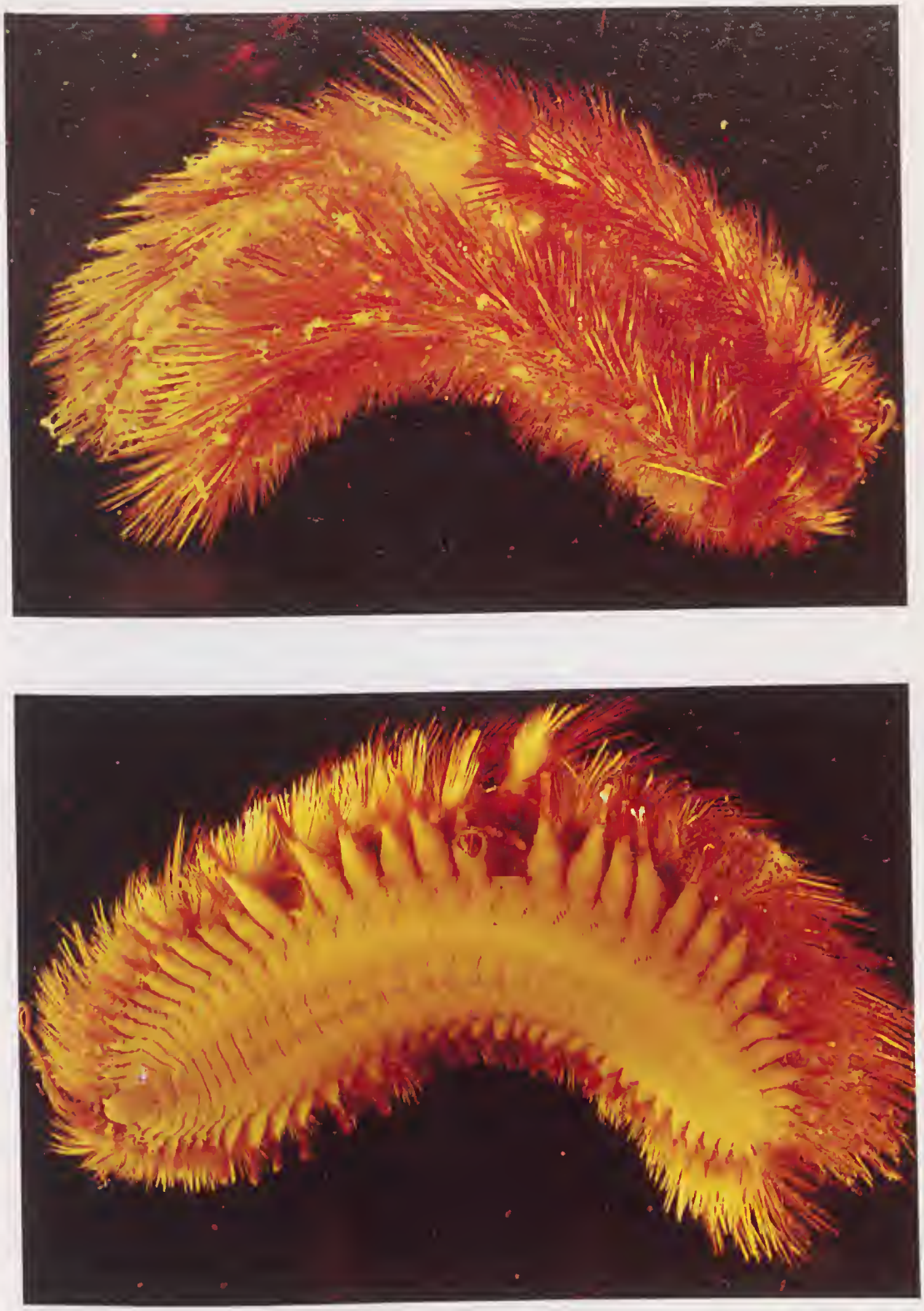

Plate 1, *Pontogenia soelae*, holotype from the Marion Plateau (NTM W.3853), 64mm long, 27mm wide, 42 segments: **A**, dorsal view, **B**, ventral view.

rosette in both elytragerous and cirrigerous segments.

Posterior segments with paleal notosetae numbering about 30 (Fig. 1E); lateral group including shorter, smooth paleae, similar to anterior-most segments; serrate types with double row of slightly thicker spines. Neuropodium 37 with 7 neurosetae in tiers, slender with spinelets between spur and distal tip. Neuropodium 41 with 5 neurosetae; slender

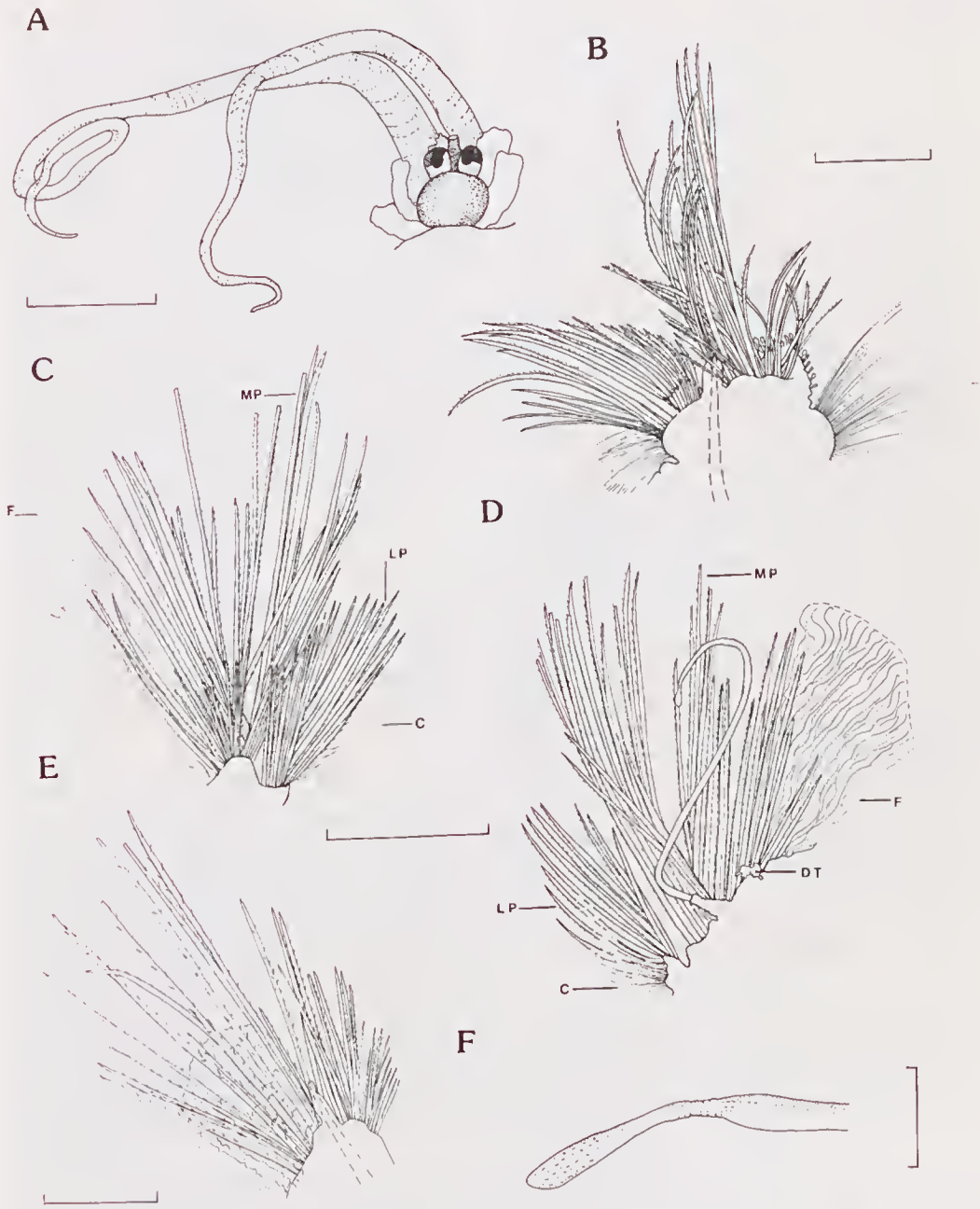

Fig. 1. *Pontogenia soelae*, holotype: **A**, prostomium; **B**, tentacular parapodium from segment 1 (styles of dorsal and ventral tentacular cirri missing); **C**, notopodium from segment 22, anterior view; **D**, same, posterior view; **E**, notopodium from segment 41, posterior view; **F**, detail of distal end of dorsal cirrus. Scales: A= 2.0mm; B= 1.0mm; C,D= 5.0mm; E= 1.0mm; F= 0.04mm. Abbreviations: **C**, capillary notosetae; **DT**, dorsal tubercle; **F**, felt; **LP**, lateral paleae; **MP**, mid-group paleae.

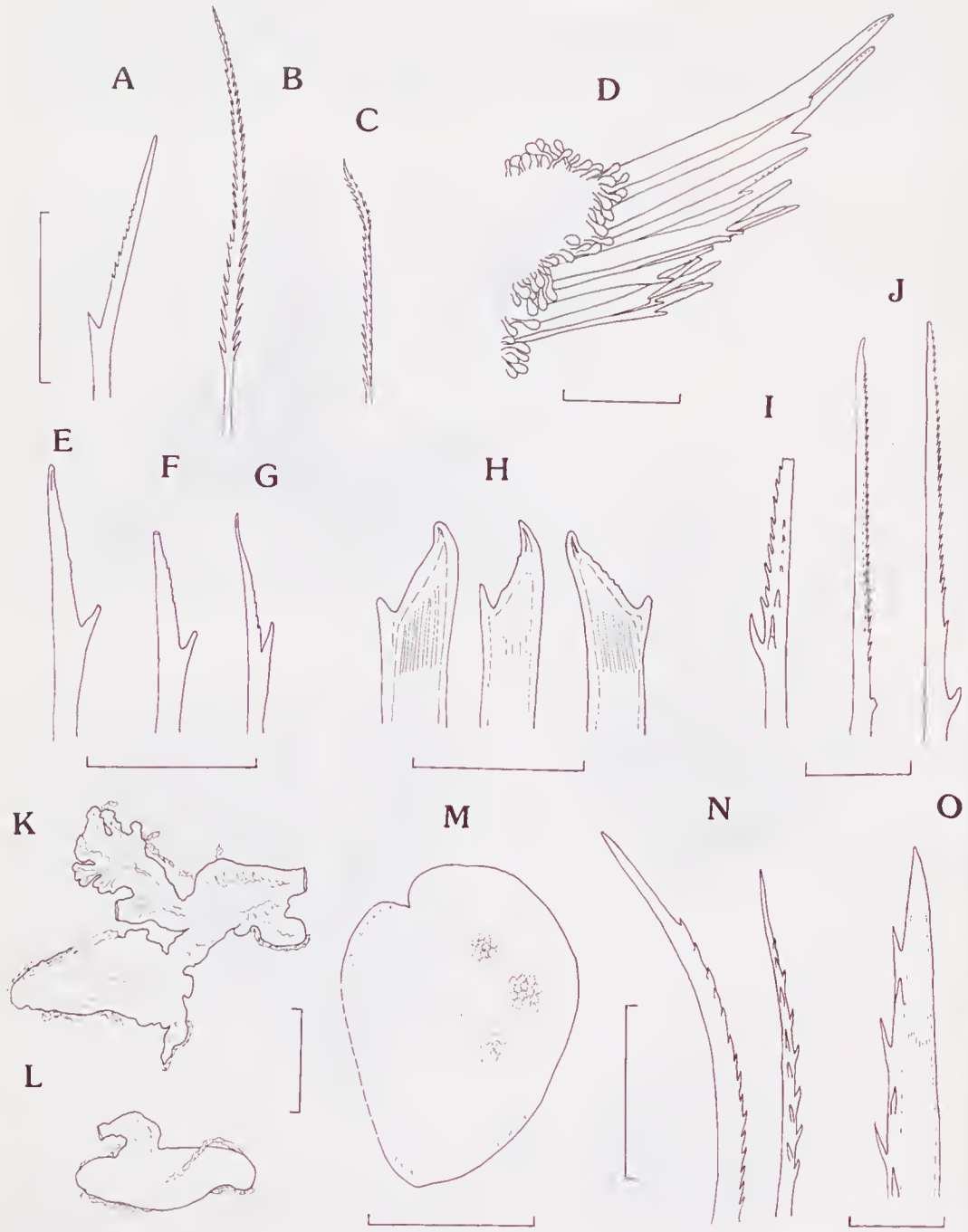

Fig. 2. *Pontogenia soelae*, holotype: **A-C**, upper bidentate, middle and lower bipinnate neurosetae of neuropodium from segment 2; **D**, neuropodium from segment 4, posterior view; **E-G**, upper, middle and lower neurosetae from same; **H**, 3 neurosetae from mid-body segment 22; **I,J**, middle neuroseta (distally broken) and 2 upper neurosetae from segment 41; **K**, dorsal caecae, **L**, ventral caeca from mid-body segment; **M**, elytron from mid-body; **N**, long and short paleae from segment 1; **O**, tip of palea from segment 22. Scales: A= 1.0mm, B= 0.2mm, C= 0.04mm; D-H= 1.0mm; I= 0.05mm; J= 0.075mm; K-L= 2.0mm; M= 5.0mm; N= 1.0mm; O= 0.2mm.

with double spur and double row of spinelets (Fig. 2I,J).

Pygidium not visible. In ventral view, pharynx long, slender, flattened. Dorsal caecae consisting of divided lobe, located just under epidermis in notopodium, plus single lobe latero-posteriorly (Fig. 2K); ventral caeca consisting of single lobe (Fig. 2L).

Distribution. Known only from the type locality, Marion Plateau, NE Australia. Depth range 303-333m.

Etymology. The specific name, *soelae*, is named after the CSIRO research vessel, FRV *Soela*, which has carried out extensive trawling studies along the Australian continental shelf.

Remarks. Two *Pontogenia* species have previously been reported from NE Australian waters. *Triceratia araeoceras* Haswell, 1882 (= *Pontogenia araeoceras*, *fide* Kudenov, in Day & Hutchings 1979) was described from a depth of 27m at Port Molle, Queensland. The specimen was not available for study but Haswell's description provides a combination of characters not found in *P. soelae*.

Horst (1917) described *Aphrogenia villosa* from Indonesian waters. Monro (1931:139) then referred to a specimen, from the Low Isles, Queensland, as '*Pontogenia villosa* Horst 1917'. Examination of the type of *A. villosa* by the author proved it to be a true aphrogeniid; examination of the latter specimen reveals that it belongs to an undetermined *Pontogenia* species.

The description of *Pontogenia soelae* is based on a single mature specimen. The unique neurosetal characters, in particular, easily separate this species from its congeners. Bidentate neurosetae number 10 per parapodium; in anterior-most segments the setae are of different lengths and ranked in upper, middle and lower sections (Fig. 2D) while mid-body the setae are of the same length. This number of neurosetae has not been described for other pontogeniid species. All other species have 4 setae per neuropodium (very rarely 5 neurosetae may be present on one neuropodium of the body within an individual).

The large number of neurosetae seen in *P. soelae* is most similar to the neurosetal numbers reported for *Aphrodite* species (i.e. 7-18). The ranking of *Aphrodite* neurosetae in tiers is similar to that found in the anterior neuropodia of *P. soela*.

Pontogenia soelae possesses bidentate neurosetae, with distinct spinelets between spur and distal tip, in anterior neuropodia (Fig. 2 A,E-G); posterior-body neurosetae also include setae with a double row of spinelets, a character not described previously for other pontogeniid species (Fig. 2I-J). The robust neurosetae of mid-body neuropodia also possess remnants of spinelets on some setae (Fig. 2H).

I have only observed spinelets on the very small and slender bidentate neurosetae of the posterior-most segments in other adult pontogeniid species (e.g. *P. spinosa* Horst, 1917; *P. nuda* Horst, 1917). The typical robust bidentate neurosetae of mid-body neuropodia belonging to most pontogeniid species are smooth.

I have also observed juveniles belonging to two pontogeniid species with spinelets on neurosetae on all neuropodia throughout the body. It appears that this juvenile character is retained in part in the adults of *P. soelae*.

The slender, spinous paleal notosetae, present in the lateral and mid-group fascicles of the notopodium, are the most numerous I have observed in any pontogeniid species. The distinctive radiate lateral paleal fascicle (paleae numbering 50) of *P. soelae* is also seen in *P. spinosa* Horst (paleae numbering 20). The paleae of *P. soelae* possess elongate spines in a double row to the distal tip, whereas *P. spinosa* possesses shorter spines in a single row at the distal end of the paleae. The dorsal cirri of *P. soelae* do not possess the definite two articles and rounded lens-like distal tip seen in the cirri of most pontogeniid species. Towards the distal end of the cirrus there is a constriction and the tip is elongate and flattened (Fig. 1F).

Pontogenia phaeogramma sp.nov.
(Figs 3-4)

Type material. HOLOTYPE - MNHN UC 212: New Caledonia, Lagon Est, Stn. 0619, 22° 03.2' S, 166° 54.2' E, 27-42m, coll. B. Richer de Forges, ORSTOM, 6 August 1986.

PARATYPES - MNHN UC 213 (1): Stn. 0613, 22° 07.3' S, 166° 59.5' E, 45-50m, coll. B. Richer de Forges, ORSTOM, 5 August 1986; NTM W.5601 (2) same data as preceding.

Description. Holotype length 56mm, width 19mm, 39 segments. Body large, broad, rec-

tangular. Dorsal surface smooth, covered by elytra. Notosetal paleal fans visible only on anterior 3 segments; following sparse paleal fans entirely covered by notosetal felt forming thick mat. felt present on cirrigerous and elytragerous segments; thick lateral fascicle of capillary notosetae forming extensive fringe; setae and ventrum stained by yellowish-brown liquid debris. Elytra 15 pairs, on segments 2,4,5,7,9.....23,25,28,31. Elytra smooth, membranous, firmly attached to elytrophores, rounded anteriorly, oval in mid-body, and elongate posteriorly; with small peg-like papillae on inner margin.

Prostomium round, very small (in comparison to size of body), oval ocular peduncles each with small dorsal and larger ventral pair of eyes; median antenna shorter than palps, with ceratophore elongate, papillate with very slender 2 articled style, distal end of long basal article with tip slightly inflated, distal part of short, second article ending in very small inflated tip; palps of striking appearance, brown with darker brown attenuated tips, with concertina-like, papillate ridges (Fig. 3A,B); papillate facial tubercle present.

First or tentacular segment (Fig. 3C) with elongated uniramous tentaculophores projecting antero-laterally to prostomium; each with 2 long dorsal and ventral tentacular cirri, 3 types of setae: 1) large, thick fascicles of long and short capillary notosetae, 2) fascicle of about 15 long flattened paleae with flame-like tips, most smooth, some with minute traces of serrations on distal margins (Fig. 3D), 3) fascicle of short, slender spine-like paleae.

Second or buccal segment with first pair of tiny elytra, biramous parapodia extending antero-laterally to mouth; notopodium with notosetae including about 7 flame-like paleae, long and short capillaries, few long, slender paleae similar to those mid-group paleae of following segments (Fig. 4C), spine-like paleae absent. Neuropodium with 2 upper slender bidentate neurosetae plus 1 long one without spur; lower fascicle of long and short bipinnate neurosetae (Fig. 3E-I); ventral or buccal cirri twice as long as cirri on following segments.

Third segment with biramous parapodia, lateral to mouth; notopodium with long dorsal cirrus; notosetae comprising 4 groups including spine and flame, mid-group paleae-like paleae and long felt; neuropodium with neurosetae as in segment 2; ventral cirri slightly longer than cirri of succeeding segments; neuropodium on right side of holotype atypically with neurosetae similar to those on neuropodia 4, with bipinnate neurosetae absent. Flame and spine-like paleae absent from notopodia 5 onwards.

Dorsal cirri with papillate cirrophores on posterior sides of notopodia of mid-body segments with long, slender style, longer than paleae fan; paleal notosetae in 3 sparse groups dorsal to cirrophore: lower group with up to 4 very slender, ereet, pointed paleae, middle group of 4 slender, curving paleae and upper group with 6 curved, flattened, slender paleae with long, attenuated tips (Fig. 4B,C). All paleae smooth with distinct inner core, mostly with distal tips broken, golden-brown colour and completely covered in felt. Lateral capillary notosetae in thick fascicles with debris attached. Felt very long, well-developed, pale golden-brown colour with greenish iridescent tinge. Large, papillate dorsal tubercle in line with elytrophores on elytragerous segments.

Elytragerous notopodia of mid-body segments with similar number and types of notosetae as on cirrigerous segments. Notopodia of posterior segments with short, spine-like paleae (some with traces of serrations on distal tips) similar to those of anterior segments, with lateral capillary setae and felt.

Neuropodia mid-body with 4 thick, blunt tipped bidentate neurosetae with distinct inner core with longitudinal and horizontal striae (Fig. 4D). Neurosetae of posterior neuropodia small, slender, with small double spur, without spinelets between spur and distal tip (Fig. 4E).

Pygidium not visible. Dorsal caeca consisting of 3 rounded, opaque white sacs (Fig. 4A).

Distribution. Known from the type locality, Lagon Est, New Caledonia. Depth range 27-50m.

Etymology. The specific name, *phaeograuma*, is a combination of the Greek *phaios*, brown, and *grauma*, mark, and refers to the distinctive brown markings on the palps.

Remarks. Rullier (1972) identified a pontogeniid specimen from New Caledonia as *Pontogenia chrysocoma*. The brief description includes mention of large, scimitar shaped paleae. *Pontogenia phaeogrammua* is distinguished from other members of *Pontogenia* by the sparse numbers of slender, smooth paleal notosetae which are completely covered by long felt and the presenee of flame-like paleal

notosetae in the anterior 3 segments only; it also possesses a single long, slender, smooth neuroseta on the neuropodia of segments 2 and 3 and distinctive palps.

The only other *Pontogenia* species with smooth paleal notosetae is *P. curva* Chamberlin, 1919 described from specimens collected from the Gulf of Mexico in 50m. Chamberlin's description and figure of the long, curving paleal notosetae of *P. curva* (1919:Pl. 10, Fig 3) is similar to those of *P. phaeogramma*; the dorsal felt forms a mat and covers the entire

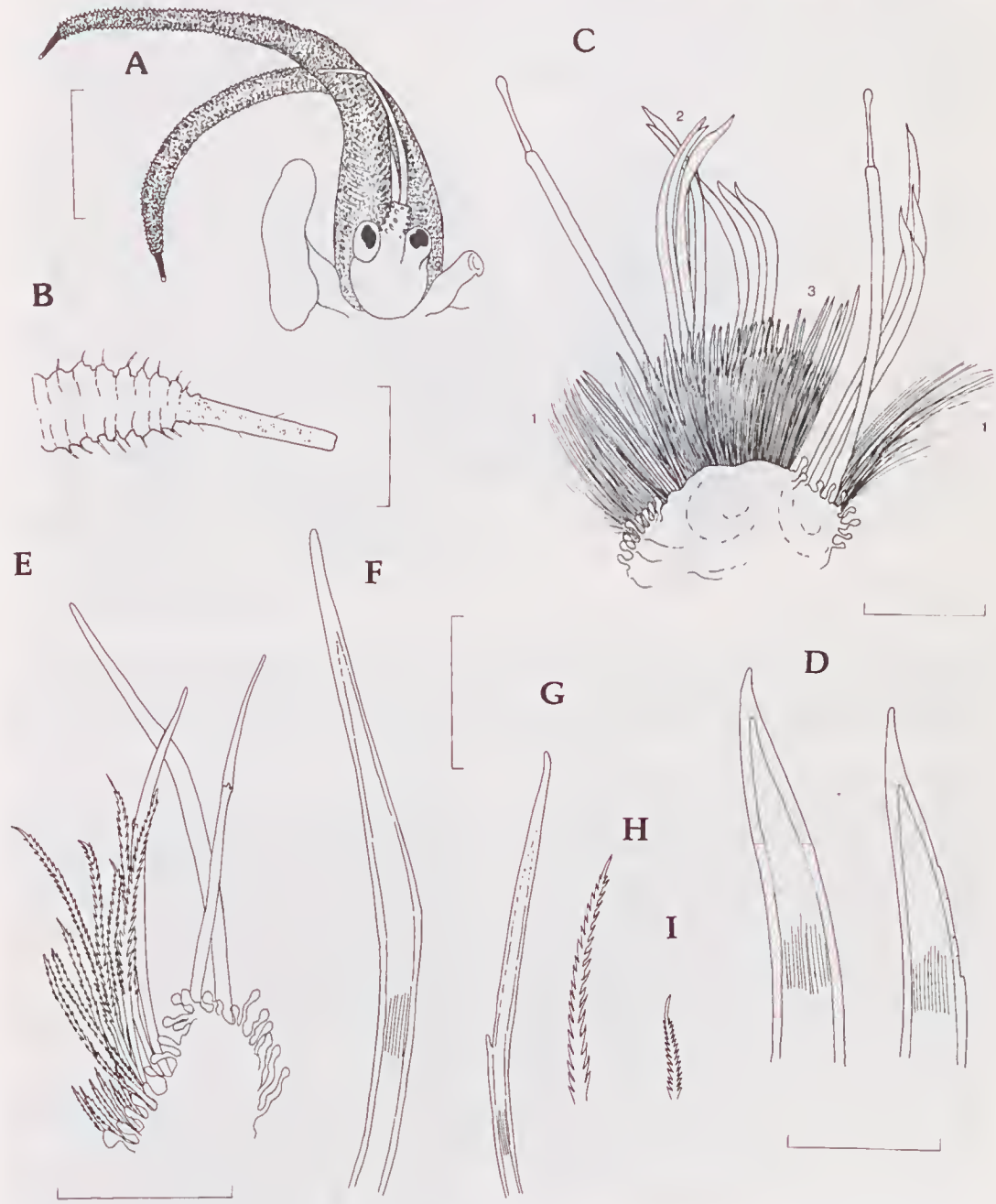

Fig. 3. *Pontogenia phaeogramma* A,B paratype, C-E holotype; **A**, prostomium, dorsal view; **B**, detail of distal end of palp; **C**, tentacular parapodium from segment 1; **D**, 2 flame-like paleae from segment 1; **E**, neuropodium from segment 2; **F-I**, neurosetae from segment 2: **F**, smooth upper, **G**, bidentate upper, **H**, lower long bipinnate, **I**, lower short bipinnate. Scales: A= 1.2mm; B= 0.4mm; C= 1.0mm; D= 0.2mm; E= 0.4mm; F-I= 0.2mm.

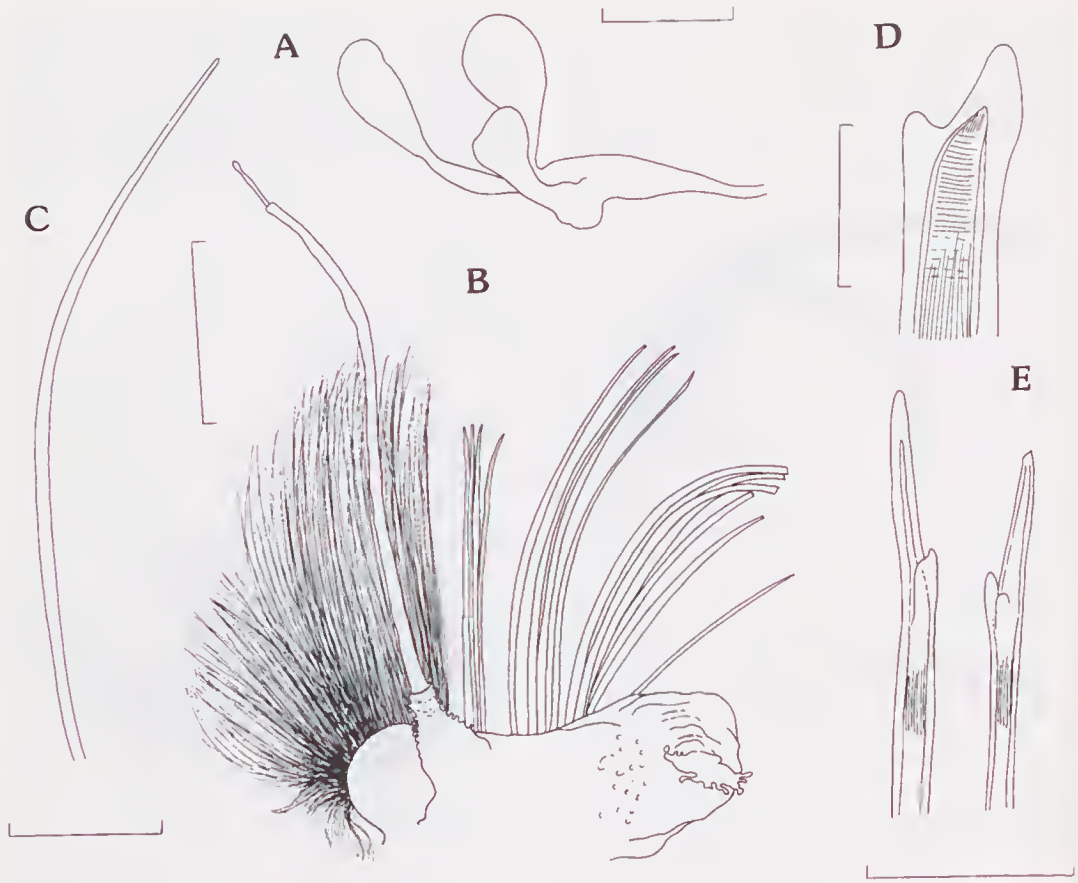

Fig. 4. *Pontogenia phaeogramma* A-E holotype, F-I paratype; A, dorsal caecae from notopodium of mid-body segment; B, cirrigerous notopodium from segment 24, posterior view, (long dorsal felt cut away); C, detail of paleal notoseta from mid-body; D, bidentate neuroseta from mid-body neuropodium, segment 19; E, 2 bidentate neurosetae from posterior neuropodium, segment 38. Scales: A= 2.0mm; B= 2.0mm; C= 1.0mm; D= 0.4mm; E= 0.2mm.

dorsum in both species. However Chamberlin (1919) states that the paleal notosetae are numerous and conspicuous and increase in length markedly in the 'caudal region': the notosetae are also described as being 'grooved' along one side. Paleal notosetae of *P.phaeogramma* are sparse and inconspicuous down most of the body and possess no groove. Neurosetae of *P. phaeogramma* are much blunter and less curved than those of *P curva* and the smallest worm of *P. phaeogramma* is much bigger (length 45mm, width 16mm) than that described for the largest specimen of *P. curva* (length 12.5mm, width 6mm). Chamberlin (1919) makes no mention of the prostomium or anterior segments. The depth range is the same for the two species.

A number of *Pontogenia* species have been described as having longitudinal papillate ridges on the palps, e.g. *P. indica* in Willey (1905). Ebbs (1966:504, Fig. 5) describes *P. sericoma* as possessing slender, tapering palps, covered in fine papillae and the distal ends forming a blunt point. I have also observed the palps of *P. obscura* Monro, 1924 with slight annulations marked by the series of long papillae down the palp. However the palps of *phaeogramma* are distinctive, with their brown colouring, concertina-like annulations and long, constricted distal tips.

There is no description in the literature of other *Pontogenia* species with flame-like paleal notosetae on the anterior segments.

The only other pontogeniid species with smooth, i.e. non bidentate, neurosetae is *P. obscura* which possesses such setae in all neuropodia down the body.

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